CHAPTER
18

Preoperative Assessment, Premedication, & Perioperative Documentation

KEY CONCEPTS

1. The cornerstones of an effective preoperative or preprocedure evaluation are the history and physical examination, which should include a complete and up-to-date listing of all medications taken by the patient in the recent past, all pertinent allergies, and responses and reactions to previous anesthetics.
2. The anesthesiologist should not be expected to provide the risk-versus-benefit discussion for the proposed surgery or procedure; this is the responsibility and purview of the responsible surgeon or "proceduralist."
3. By convention physicians in many countries use the American Society of Anesthesiologists' classification to identify relative risk prior to conscious sedation and surgical anesthesia.
4. In general, the indications for cardiovascular investigations are the same in elective surgical patients as in any other patient with a similar medical condition.
5. Adequacy of long-term blood glucose control can be easily and rapidly assessed by measurement of hemoglobin A_{1c}.
6. In patients deemed at high risk for thrombosis (eg, those with certain mechanical heart valve implants or with atrial fibrillation and a prior thromboembolic stroke), chronic anticoagulants should be replaced by intramuscular low-molecular-weight heparins or by intravenous unfractionated heparin.
7. Current guidelines recommend postponing all but mandatory emergency surgery until at least 1 month after any coronary intervention and suggest that treatment options *other* than a drug-eluting stent (which will require prolonged dual antiplatelet therapy) be used in patients expected to undergo a surgical procedure within 12 months after the intervention.
8. There are no good data to support restricting fluid intake (of any kind or any amount) more than 2 h before induction of general anesthesia in healthy patients undergoing elective procedures; moreover, there is strong evidence that nondiabetic patients who drink fluids containing carbohydrates and protein up to 2 h before induction of anesthesia suffer less perioperative nausea and dehydration than those who are fasted longer.
9. To be valuable, preoperative testing must discriminate: There must be an avoidable increased perioperative risk when the results are abnormal (and the risk will remain unknown if the test is not performed), and when testing fails to detect the abnormality (or it has been corrected), there must be reduced risk.

10 The utility of a test depends on its sensitivity and specificity. Sensitive tests have a low rate of false-negative results and rarely fail to identify an abnormality when one is present, whereas specific tests have a low rate of false-positive results and rarely identify an abnormality when one is not present.

11 Premedication should be given purposefully, not as a mindless routine.

12 Incomplete, inaccurate, or illegible records unnecessarily complicate defending a physician against otherwise unjustified allegations of malpractice.

PREOPERATIVE EVALUATION

1 The cornerstones of an effective preoperative or preprocedure evaluation are the medical history and physical examination, which should include a complete and up-to-date listing of all medications taken by the patient in the recent past, all pertinent allergies, and responses and reactions to previous anesthetics. Additionally, this evaluation may include diagnostic tests, imaging procedures, or consultations from other physicians when indicated. A patient's initial contact with a perioperative surgical home or enhanced recovery after surgery (ERAS) program ideally will occur at the time of the preoperative evaluation visit. An enhanced recovery may require "prehabilitation" with one or more of the following: smoking cessation, nutritional supplementation, an exercise regimen, and adjustment of medications. The preoperative evaluation will often guide the anesthetic plan. Inadequate preoperative planning and incomplete patient preparation commonly lead to avoidable delays, cancellations, complications, and costs.

The preoperative evaluation serves multiple purposes. One purpose is to identify those patients whose outcomes likely will be improved by implementation of a specific medical treatment (which rarely may require that planned surgery be rescheduled). For example, a 60-year-old patient scheduled for elective total hip arthroplasty who also has unstable angina from left main coronary artery disease would more likely survive if coronary artery bypass grafting is performed before rather than after the elective orthopedic procedure. Another purpose of the preoperative evaluation is to identify patients whose condition is so poor that the proposed surgery might only hasten death without improving the quality of life. For example, a patient with severe chronic lung disease, end-stage kidney disease, liver failure, and chronic heart failure likely would not survive to derive benefit from an 8-h, complex, multilevel spinal fusion with instrumentation. A patient's preoperative evaluation can uncover findings that will change the anesthetic plan (Table 18–1). For example, the anesthetic plan may need to be adjusted for a patient whose trachea appears difficult to intubate, one with a family history of malignant hyperthermia, or one with an infection near where a proposed regional anesthetic would be administered.

TABLE 18–1 The anesthetic plan.

Will sedative-hypnotic premedication be useful?
What type(s) of anesthesia will be employed?
- General[1]
  - Airway management
  - Induction drugs
  - Maintenance drugs
- Regional
  - Technique(s)
  - Agent(s)
- Sedation and monitored anesthesia care
  - Supplemental oxygen
  - Specific sedative drugs

Are there special intraoperative management issues?
- Nonstandard monitors
- Positions other than supine
- Relative or absolute contraindications to specific anesthetic drugs
- Fluid management
- Special techniques
- Site (anesthetizing location) concerns

How will the patient be managed postoperatively?
- Management of acute pain
- Intensive care
  - Postoperative ventilation
  - Hemodynamic monitoring

[1]Including need for (or need for avoidance of) muscle relaxation.

Another purpose of the preoperative evaluation is to provide the patient with an estimate of anesthetic (2) risk. However, the anesthesiologist should not be expected to provide the risk-versus-benefit discussion for the proposed surgery or procedure; this is the responsibility and purview of the responsible surgeon or "proceduralist." For example, a discussion of the risks and benefits of robot-assisted laparoscopic prostatectomy versus "open" prostatectomy, radiation therapy, or "watchful waiting" requires detailed knowledge of the current medical literature and the capabilities of an individual surgeon. Finally, the preoperative evaluation presents an opportunity for the anesthesiologist to describe the proposed anesthetic plan in the context of the overall surgical and postoperative plan, provide the patient with psychological support, and obtain informed consent for the proposed anesthetic plan from the surgical patient.

(3) By convention, physicians in many countries use the American Society of Anesthesiologists' (ASA) physical status classification to define relative risk prior to conscious sedation or surgical anesthesia (Table 18–2). The ASA physical status classification has many advantages: it is time tested, simple, and reproducible, and, most importantly, it has been shown to be strongly associated with perioperative risk. However, many other risk assessment tools are available, particularly in the area of cardiovascular risk

assessment (see Chapter 21).

TABLE 18–2 American Society of Anesthesiologists' physical status classification of patients.[1]

Class	Definition
1	Normal healthy patient
2	Patient with mild systemic disease (no functional limitations)
3	Patient with severe systemic disease (some functional limitations)
4	Patient with severe systemic disease that is a constant threat to life (functionality incapacitated)
5	Moribund patient who is not expected to survive without the operation
6	Brain-dead patient whose organs are being removed for donor purposes
E	If the procedure is an emergency, the physical status is followed by "E" (eg, "2E")

[1]Data from Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, et al. Practice advisory for preanesthesia evaluation: An updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. *Anesthesiology*. 2012 Mar;116(3):522-538.

Elements of the Preoperative History

Patients presenting for elective surgery and anesthesia typically require the recording of a focused medical history emphasizing abnormalities of exercise tolerance; nutritional and functional status; cardiac, pulmonary, endocrine, kidney, or liver function; electrolytes or metabolism; and anatomic issues relevant to airway management or regional anesthesia. How the patient responded to and recovered from previous anesthetics can be helpful. The ASA and other societies publish and periodically update general guidelines for preoperative assessment (see Guidelines at end of chapter).

A. Cardiovascular Issues

Guidelines for preoperative cardiac assessment are regularly updated and available from the American College of Cardiology/American Heart Association and from the European Society of Cardiology (see Guidelines). A more complete discussion of cardiovascular assessment is provided in Chapter 21. The focus of preoperative cardiac assessment should

be on determining whether the patient would benefit from further cardiac evaluation or interventions prior to the scheduled surgery. However, the same approach is not appropriate for all patients. The prudent approach to a patient undergoing elective knee arthroplasty will differ from that for a patient needing resection of pancreatic cancer, given the benign results of a delay in the former procedure and the possible deadly effects of a delay in the latter 4 procedure. In general, the indications for cardiovascular investigations are the same in elective surgical patients as in any other patient with a similar medical condition. Put another way, the fact that a patient is scheduled to undergo elective surgery does not change the indications for testing to diagnose coronary artery disease.

B. Pulmonary Issues

Perioperative pulmonary complications, most notably postoperative respiratory depression and respiratory failure, are vexing problems associated with obesity and obstructive sleep apnea. A guideline developed by the American College of Physicians identifies patients 60 years of age or older and those with chronic obstructive lung disease, with markedly reduced exercise tolerance, with functional dependence, or with heart failure as potentially requiring preoperative and postoperative interventions to avoid respiratory complications. The risk of postoperative respiratory complications is closely associated with these factors, and with the following: ASA physical status 3 and 4, cigarette smoking, surgeries lasting longer than 4 h, certain types of surgery (abdominal, thoracic, aortic aneurysm, head and neck, and emergency surgery), and general anesthesia (compared with cases in which general anesthesia was not used).

Efforts at prevention of respiratory complications in patients at risk should include cessation of cigarette smoking several weeks before surgery and lung expansion techniques (eg, incentive spirometry) after surgery. Patients with asthma, particularly those receiving suboptimal medical management, have a greater risk for bronchospasm during airway manipulation. Appropriate use of analgesia and monitoring are key strategies for avoiding postoperative respiratory depression in patients with obstructive sleep apnea. Further discussion of this topic appears in Chapter 44.

C. Endocrine and Metabolic Issues

The appropriate target blood glucose concentration has been the subject of several celebrated clinical trials. “Tight” control of blood glucose, with a target concentration in the “normal” range, was shown in the Diabetes Control and Complications Trial to improve outcomes in ambulatory patients with type 1 diabetes mellitus. Other more recent trials conducted in subjects with critical illness have shown that blood glucose should not be so tightly controlled.

The usual practice is to obtain a blood glucose measurement in diabetic patients on the morning of elective surgery. Unfortunately, many diabetic patients presenting for elective surgery do not maintain blood glucose within the desired range. Other patients, who may be unaware that they have type 2 diabetes, present with blood glucose measurements 5 above the normal range. Adequacy of long-term blood glucose control can be easily and

rapidly assessed by measurement of hemoglobin A_{1c}. In patients with abnormally elevated hemoglobin A_{1c}, referral to a diabetology service for education about the disease and adjustment of diet and medications to improve metabolic control may be beneficial. Elective surgery should be delayed in patients presenting with marked hyperglycemia; in an otherwise well-managed patient with type 1 diabetes, this delay might consist only of rearranging the order of scheduled cases to allow insulin infusion to bring the blood glucose concentration closer to the normal range before surgery. A more complete discussion of diabetes mellitus and other perioperative endocrine concerns is provided in Chapter 35.

D. Coagulation Issues

Three important coagulation issues that must be addressed during the preoperative evaluation are (1) how to manage patients who are taking warfarin or other long-acting anticoagulants on a long-term basis; (2) how to manage patients with coronary artery disease who are taking clopidogrel or related agents; and (3) whether one can safely provide neuraxial anesthesia to patients who either are receiving long-term anticoagulation therapy or who will receive anticoagulation perioperatively. In the first circumstance, most patients undergoing anything more involved than minor surgery will require discontinuation of anticoagulation in advance of surgery to avoid excessive blood loss. The key issues to be addressed are how far in advance the drug should be discontinued and whether the patient will require "bridging" therapy with another, shorter-acting, [6] agent. In patients deemed at high risk for thrombosis (eg, those with certain mechanical heart valve implants or with atrial fibrillation and a prior thromboembolic stroke), chronic anticoagulants should be replaced by intramuscular low molecular weight heparins (eg, enoxaparin) or by intravenous unfractionated heparin. The prescribing physician and surgeon may need to be consulted regarding discontinuation of these agents and whether bridging will be required. In patients with a high risk of thrombosis who receive bridging therapy, the risk of death from excessive bleeding is an order of magnitude lower than the risk of death or disability from stroke if the bridging therapy is omitted. Patients at lower risk for thrombosis may have their anticoagulant drug discontinued preoperatively and then reinitiated after successful surgery.

Clopidogrel and similar agents are often administered with aspirin (so-called dual antiplatelet therapy) to patients with coronary artery disease who have received intracoronary stenting. Immediately after stenting, such patients are at increased risk of acute myocardial infarction if clopidogrel (or related agents) and aspirin are abruptly discontinued. [7] Therefore, current guidelines recommend postponing all but mandatory surgery until at least 1 month after any coronary intervention and suggest that treatment options *other* than a drug-eluting stent (which will require prolonged dual antiplatelet therapy) be used in patients expected to undergo a surgical procedure within 12 months after the intervention (eg, a patient with coronary disease who also has resectable colon cancer). As the drugs, treatment options, and consensus guidelines are updated frequently, when we are in doubt we consult with a cardiologist when patients receiving these agents require a surgical procedure.

The third issue—when it may be safe to perform regional (particularly neuraxial) anesthesia in patients who are or will be receiving anticoagulation therapy—has also been the subject of debate. The American Society of Regional Anesthesia and Pain Medicine publishes a regularly updated consensus guideline on this topic, and other prominent societies (eg, the European Society of Anaesthesiologists) also provide guidance on this topic (see Chapter 45).

E. Gastrointestinal Issues

Since Mendelson's 1946 report, aspiration of gastric contents has been recognized as a potentially disastrous pulmonary complication of surgical anesthesia. It has also been long recognized that the risk of aspiration is increased in certain groups of patients: pregnant women in the second and third trimesters, those whose stomachs have not emptied after a recent meal, and those with serious gastroesophageal reflux disease (GERD).

Although there is consensus that pregnant women and those who have recently (within 6 h) consumed a full meal should be treated as if they have "full" stomachs, there is less consensus as to the necessary period of time in which patients must fast before elective surgery. Proof of the lack of consensus is the fact that the ASA's guideline on this topic was voted down by the ASA House of Delegates several years in a row before it was presented in a form that received majority approval. The guideline as approved is more permissive of fluid intake than many anesthesiologists would prefer, and many medical centers have policies that are more restrictive 8 than the ASA guideline on this topic. The truth is that there are no good data to support restricting fluid intake (of any kind or any amount) more than 2 h before induction of general anesthesia in healthy patients undergoing elective procedures; moreover, there is strong evidence that nondiabetic patients who drink fluids containing carbohydrates and protein up to 2 h before induction of anesthesia suffer less perioperative nausea and dehydration than those who are fasted longer.

Patients claiming a history of GERD present vexing problems. Some of these patients will be at increased risk for aspiration; others may carry this "self-diagnosis" based on advertisements or internet searches, or may have been given this diagnosis by a physician who did not follow the standard diagnostic criteria. Our approach is to treat patients who have only occasional symptoms like any other patient without GERD, and to treat patients with consistent symptoms (multiple times per week) with medications (eg, nonparticulate antacids such as sodium citrate) and techniques (eg, tracheal intubation rather than laryngeal mask airway) as if they were at increased risk for aspiration.

Elements of the Preoperative Physical Examination

The preoperative history and physical examination complement one another: The physical examination may detect abnormalities not apparent from the history, and the history helps focus the physical examination. Examination of healthy asymptomatic patients should include measurement of vital signs (blood pressure, heart rate, respiratory rate, and temperature) and examination of the airway, heart, and lungs using standard techniques of

inspection, palpation, percussion, and auscultation. Before administering regional anesthetics or inserting invasive monitors, one should examine the relevant anatomy; infection or anatomic abnormalities near the site may contraindicate the planned procedure (see Chapters 5, 45, and 46). An abbreviated, focused neurological examination serves to document whether any neurological deficits may be present *before* a regional anesthesia procedure is performed.

The anesthesiologist should examine the patient's airway before every anesthetic is administered. Any loose or chipped teeth, caps, bridges, or dentures should be noted. Poor fit of the anesthesia mask should be expected in edentulous patients and those with significant facial abnormalities. Micrognathia (a short distance between the chin and the hyoid bone), prominent upper incisors, a large tongue, limited range of motion of the temporomandibular joint or cervical spine, or a short or thick neck suggest that difficulty may be encountered in direct laryngoscopy for tracheal intubation (see Chapter 19). The Mallampati score is often recorded.

Preoperative Laboratory Testing

Routine laboratory testing is not recommended for fit and asymptomatic patients. "Routine" testing is avoidably expensive and rarely alters perioperative management; moreover, inconsequential abnormal values may result in further unnecessary testing, delays, and costs. Nonetheless, despite no evidence of benefit, some physicians request blood tests, an electrocardiogram, and a chest radiograph for all patients, perhaps in the misplaced hope of reducing their exposure to litigation.

Ideally, testing should be guided by the history 9 and physical examination. To be valuable, preoperative testing must discriminate: There must be an avoidable increased perioperative risk when the results are abnormal (and the risk will remain unknown if the test is not performed), and when testing fails to detect the abnormality (or it has been corrected), there must be reduced risk. Useful tests have a low rate of false-positive and false-negative 10 results (Table 18–3). The utility of a test depends on its sensitivity and specificity. Sensitive tests have a low rate of false-negative results and rarely fail to identify an abnormality when one is present, whereas specific tests have a low rate of false-positive results and rarely identify an abnormality when one is not present.

TABLE 18–3 Calculation of sensitivity and specificity based on presence or absence of disease in the population being tested.

True positives (TP) have both a positive test and the disease for which they are being tested

False positives (FP) have a positive test but do not have the disease

True negatives (TN) have a negative test and do not have the disease for which they are being tested

False negatives (FN) have a negative test but do have the disease

$$\text{Sensitivity} = TP/(TP + FN)$$

$$\text{Specificity} = TN/(TN + FP)$$

The predictive value of a positive test (PV+) indicates the likelihood that the patient has the disease if they test positive.

$$(PV+) = TP/(TP + FP)$$

The predictive value of a negative test (PV–) indicates the likelihood that the patient is free of the disease if they test negative

$$(PV-) = TN/(TN + FN)$$

The prevalence of a disease or of an abnormal test result varies with the population tested. Testing is therefore most effective when sensitive and specific tests are used in patients in whom the abnormality will be detected frequently enough to justify the expense and inconvenience of the test procedure. Accordingly, laboratory testing should be based on the history and physical examination and the nature of the proposed surgery or procedure. Thus, a baseline hemoglobin or hematocrit measurement is desirable in any patient about to undergo a procedure in which extensive blood loss and transfusion are likely, particularly when there is sufficient time to correct anemia preoperatively (eg, with iron supplements).

Testing fertile women and girls for pregnancy is controversial (but done routinely in many centers) and should not be done without the permission of the patient; pregnancy testing involves detection of chorionic gonadotropin in urine or serum. Routine testing for HIV and routine coagulation studies are not indicated. Urinalysis is not cost-effective in asymptomatic healthy patients; nevertheless, a preoperative urinalysis is required by state law in at least one U.S. jurisdiction.

PREMEDICATION

A classic study showed that a preoperative visit from an anesthesiologist resulted in greater reduction in patient anxiety than preoperative sedative drugs. Yet, there was a time when virtually every patient received premedication before arriving in the preoperative area in anticipation of surgery. The belief was that all patients benefitted from preoperative sedation and anticholinergics, often combined with an opioid. With the move to outpatient surgery and "same-day" hospital admission, preoperative sedative-hypnotics or opioids are now almost never administered before patients arrive in the preoperative holding area for elective surgery. Children, especially those aged 2 to 10 years who (along with their parents)

likely will experience separation anxiety may benefit from premedication administered in the preoperative holding area. This topic is discussed in Chapter 42. Oral or intravenous midazolam or nasal dexmedetomidine are common methods. Adults often receive intravenous midazolam (2–5 mg) once an intravenous line has been established. If a painful procedure (eg, regional block or a central venous line) will be performed while the patient remains awake, small doses of opioid (typically fentanyl) will often be given. Patients who will undergo airway surgery or extensive airway manipulations benefit from preoperative administration of an anticholinergic agent (glycopyrrolate or atropine) to reduce airway secretions before and during surgery. Patients who are expected to have significant amounts of postoperative pain will often be given "multimodal" analgesia, including various combinations of nonsteroidal antiinflammatory drugs, acetaminophen, gabapentinoids, and anti-nausea drugs in the preoperative holding area. The fundamental message here is that premedication should be given purposefully, not as a mindless routine.

DOCUMENTATION

Physicians should provide high-quality, safe, and cost-efficient medical care. But they also must document the care that they provide. Adequate documentation provides guidance to those who will encounter the patient in the future. It permits others to assess the quality of the care that was given and to provide risk adjustment of outcomes. Without documentation a physician will not be paid for his or her services; incomplete documentation may not justify the otherwise appropriate "full" payment. Incomplete documentation may render it difficult for a hospital system to recover its costs and may incorrectly lead to the conclusion that a patient's hospitalization was inappropriately prolonged. Finally, adequate and organized documentation (as opposed to inadequate and disorganized documentation) supports a potential defense case should a claim for medical malpractice be filed.

Preoperative Assessment Note

The preoperative assessment note should appear in the patient's permanent medical record and should describe pertinent findings, including the medical history, anesthetic history, current medications (and whether they were taken on the day of surgery), physical examination, ASA physical status, laboratory results, interpretation of imaging, electrocardiograms, and pertinent recommendations of any consultants. A comment is particularly important when a consultant's recommendation will not be followed.

The preoperative note should identify the anesthetic plan, indicating whether regional or general anesthesia (or sedation) will be used, and whether invasive monitoring or other advanced techniques will be employed. It should include a statement regarding the informed consent discussion with the patient (or guardian). Documentation of the informed consent discussion may take the form of a narrative indicating that the plan, alternative plans, and their advantages and disadvantages (including their relative risks) were presented, understood, and accepted by the patient. Some centers include consent for

anesthesia within the consent for surgery (or the procedure). Alternatively, the patient may be asked to read and sign a separate anesthesia consent form that contains the same information.

In the United States, the Joint Commission (TJC) requires an immediate preanesthetic "reevaluation" to determine whether the patient's status has changed in the time since the preoperative evaluation was performed. This reevaluation might include a review of the medical record to search for any new laboratory results or consultation reports if the patient was last seen on another date. However, even when the elapsed time is less than a minute, the bureaucracy will not be denied: the "box" must be checked to document that there has been no interval change.

Intraoperative Anesthesia Record

The intraoperative anesthesia record serves many purposes. It functions as documentation of intraoperative monitoring, a reference for future anesthetics for that patient, and a source of data for quality assurance. This record should be terse, pertinent, and accurate. Increasingly, parts of the anesthesia record are generated automatically and recorded electronically. Such anesthesia information management systems (commonly abbreviated AIMS) have many theoretical and practical advantages over the traditional paper record but also introduce all the common pitfalls of computerization, including the potential for unrecognized recording of artefactual data, the possibility that practitioners will find attending to the computer more interesting than attending to the patient, and the inevitable occurrence of device and software shutdowns. Regardless of whether the record is on paper or electronic it should document the anesthetic care in the operating room by including the following elements:

- That there has been a preoperative check of the anesthesia machine and other relevant equipment
- That there has been a reevaluation of the patient immediately prior to induction of anesthesia (a TJC requirement)
- Time of administration, dosage, and route of drugs given intraoperatively
- Intraoperative estimates of blood loss and urinary output
- Results of laboratory tests obtained during the operation (when there is an AIMS linked to an electronic medical record, such testing may be recorded elsewhere)
- Intravenous fluids and any blood products administered
- Pertinent procedure notes (eg, for tracheal intubation or insertion of invasive monitors)
- Any specialized intraoperative techniques such as hypotensive anesthesia, one-lung ventilation, high-frequency jet ventilation, or cardiopulmonary bypass
- Timing and conduct of intraoperative events such as induction, positioning, surgical incision, and extubation
- Unusual events or complications (eg, cardiac arrest)

- Condition of the patient at the time of "handoff" to the postanesthesia or intensive care unit nurse

By tradition and convention (and, in the United States, according to practice guidelines) arterial blood pressure and heart rate are recorded graphically at no less than 5 min intervals. Data from other monitors are also usually entered graphically, whereas descriptions of techniques or complications are described in text.

Unfortunately, the conventional, handwritten anesthetic record is ill suited for documenting critical incidents, such as a cardiac arrest. In such cases, a separate text note inserted in the patient's medical record may be necessary. Careful recording of the timing of events is needed to avoid discrepancies between multiple simultaneous records (anesthesia record, nurses' notes, cardiopulmonary resuscitation record, and other physicians' entries in the medical record). Such discrepancies are frequently targeted by malpractice attorneys as evidence of incompetence, inaccuracy, or deceit. Incomplete, inaccurate, or illegible records unnecessarily complicate defending a physician against otherwise unjustified allegations of malpractice.

Postoperative Notes

After accompanying the patient to the postanesthesia care unit (PACU), the anesthesia provider should remain with the patient until normal vital signs have been measured and the patient's condition is deemed stable. An unstable patient may require being "handed off" to another physician. Before discharge from the PACU, a note should be written by an anesthesiologist to document the patient's recovery from anesthesia, any apparent anesthesia-related complications, the immediate postoperative condition of the patient, and the patient's disposition (discharge to an outpatient area, an inpatient ward, an intensive care unit, or home). In the United States, as of 2009, the Centers for Medicare and Medicaid Services require that certain elements be included in all postoperative notes (Table 18–4). Recovery from anesthesia should be assessed at least once within 48 h after discharge from the PACU in all inpatients. Postoperative notes should document the general condition of the patient, the presence or absence of any anesthesia-related complications, and any measures undertaken to treat such complications. The anesthesiologist's involvement with the patient may continue through the early stages of postoperative recovery when the anesthesiologist is involved in a functioning perioperative surgical home or is providing treatment of postoperative pain (see Chapters 48, 59).

TABLE 18–4 Elements required by the Center for Medicare and Medicaid Services in all postoperative notes.[1]

Respiratory function, including respiratory rate, airway patency, and oxygen saturation
Cardiovascular function, including pulse rate and blood pressure
Mental status
Temperature
Pain
Nausea and vomiting
Postoperative hydration

[1]Data from the Centers for Medicare and Medicaid Services (CMS). *Revised Anesthesia Services Interpretive Guidelines*, issued December 30, 2009. Available at: http://www.kdheks.gov/bhfr/download/Appendix_L.pdf (accessed December 15, 2017).

CASE DISCUSSION

Medical Malpractice (also see Chapter 54)

A healthy 45-year-old man has a cardiac arrest during an elective laparoscopic inguinal hernia repair. Although cardiopulmonary resuscitation is successful, the patient is left with permanent neuropsychological deficits that preclude his return to work. One year later, the patient files a complaint against the anesthesiologist, surgeon, and hospital.

What four elements must be proved by the plaintiff (patient) to establish negligence on the part of the defendant (physician or hospital)?

1. *Duty:* Once a physician establishes a professional relationship with a patient, the physician owes that patient certain obligations, such as adhering to the "standard of care."
2. *Breach of Duty:* If these obligations are not fulfilled, the physician has breached his duties to the patient.
3. *Injury:* An injury must result. The injury may result in general damages (eg, pain and suffering) or special damages (eg, loss of income).
4. *Causation:* The plaintiff must demonstrate that the breach of duty was the *proximate cause* of the injury. But for the breach of duty, the injury should not have occurred.

How is the standard of care defined and established?

Individual physicians are expected to perform as any prudent and reasonable physician would in similar circumstances. This does *not* mandate "best" care or optimal care, only care that would meet the minimum standard of a prudent and reasonable physician. As a specialist, the anesthesiologist is held to a higher standard of knowledge and skill with respect to the subject matter of anesthesia than would a

general practitioner or a physician in another specialty. Expert witnesses usually provide testimony to define the standard of care in legal proceedings. Medical malpractice cases are governed by the laws of the state or jurisdiction in which the event took place, and these may differ from state to state. For example, some states require that an expert witness have practiced medicine recently in the state or an immediately adjacent state; others have no "residence" requirement for expert witnesses. The specific circumstances pertaining to each individual case are taken into account. The law recognizes that there are differences of opinion and varying schools of thought within the medical profession.

How is causation determined?

It is usually the plaintiff who bears the burden of proving that the injury would not have occurred "but for" the negligence of the physician, or that the physician's action was a "substantial factor" in causing the injury. An exception is the doctrine of *res ipsa loquitur* ("the thing speaks for itself"), which permits a finding of negligence based solely on the evidence. For example, if a set of car keys were visualized inside a patient on a chest radiograph after a thoracotomy, the doctrine of *res ipsa loquitur* would apply. *Res ipsa loquitur* could not be used in the case under discussion because the plaintiff would have to establish that cardiac arrest could not occur in the absence of negligence and that cardiac arrest could not have been due to something outside the control of the anesthesiologist. An important concept is that causation in civil cases in the United States need only be established by a preponderance of the evidence ("more likely than not")—as opposed to criminal cases, in which all elements of a charged offense must be proved "beyond a reasonable doubt."

What factors influence the likelihood of a malpractice suit?

1. *The Physician–Patient Relationship:* This is particularly important for the anesthesiologist, who usually does not meet the patient until immediately before the anesthetic is administered. Another problem is that the patient is unconscious while under the anesthesiologist's care. Thus, the preoperative and postoperative visits with the patient are often the only opportunities to establish a good relationship with the patient. Family members should also be included during these meetings with patients (provided the patient does not object), particularly during the postoperative visit if there has been an intraoperative complication.
2. *Adequacy of Informed Consent:* Rendering care to a competent patient who does not consent constitutes assault and battery. Consent is not enough, however. The patient should be informed of the contemplated procedure, including its reasonably anticipated risks, its possible benefits, and the therapeutic alternatives. The physician may be liable for a complication—even if it is not due to the negligent performance of a procedure—if a jury is convinced that a reasonable person would have refused treatment if properly informed of the possibility of the complication. This does not mean, of course, that a documented consent relieves

from liability physicians who violate the standard of care.

3. *Quality of Documentation:* Careful documentation of the perioperative visits, informed consent, consultations with other specialists, intraoperative events, and postoperative care is essential. The viewpoint of many courts and juries, reinforced by plaintiff's attorneys, is that "if it isn't written, it wasn't done." It goes without saying that medical records should never be intentionally destroyed or altered.

GUIDELINES

http://www.asahq.org/quality-and-practice-management/standards-and-guidelines

https://www.asra.com/advisory-guidelines/article/1/anticoagulation-3rd-edition

Fleisher LA, Fleischmann KE, Auerbach AD, et al. American College of Cardiology; American Heart Association. ACC/AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines. *J Am Coll Cardiol*. 2014;64:e77.

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SUGGESTED READINGS

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